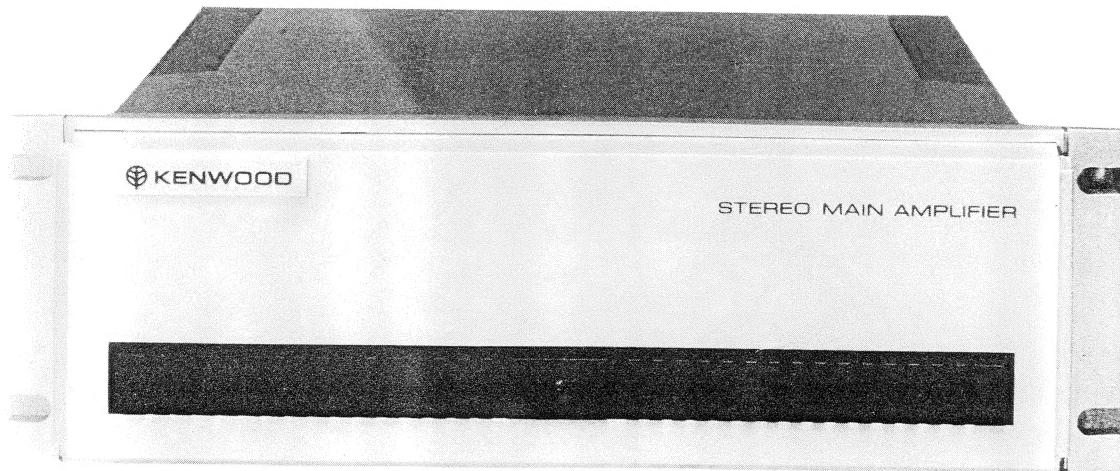


KENWOOD®
STEREO FOR YOUR CAR

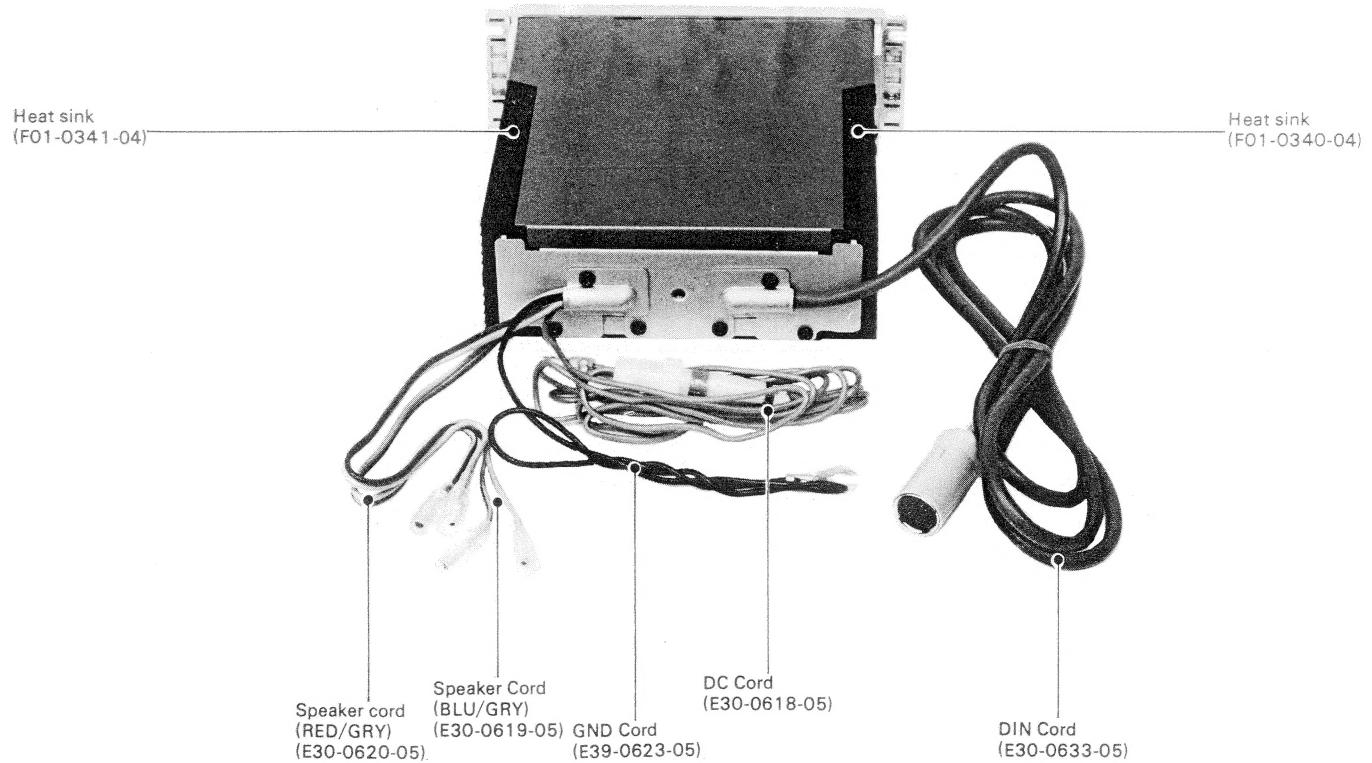
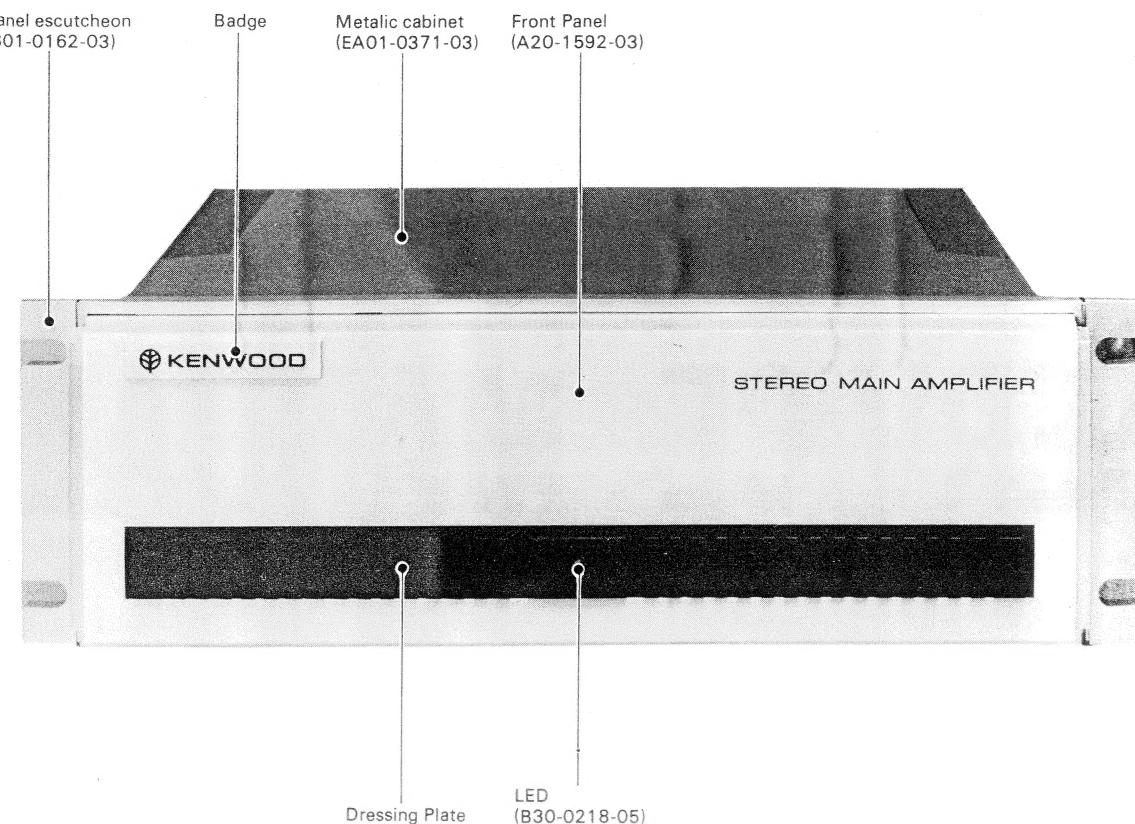
SERVICE MANUAL

KAC-727

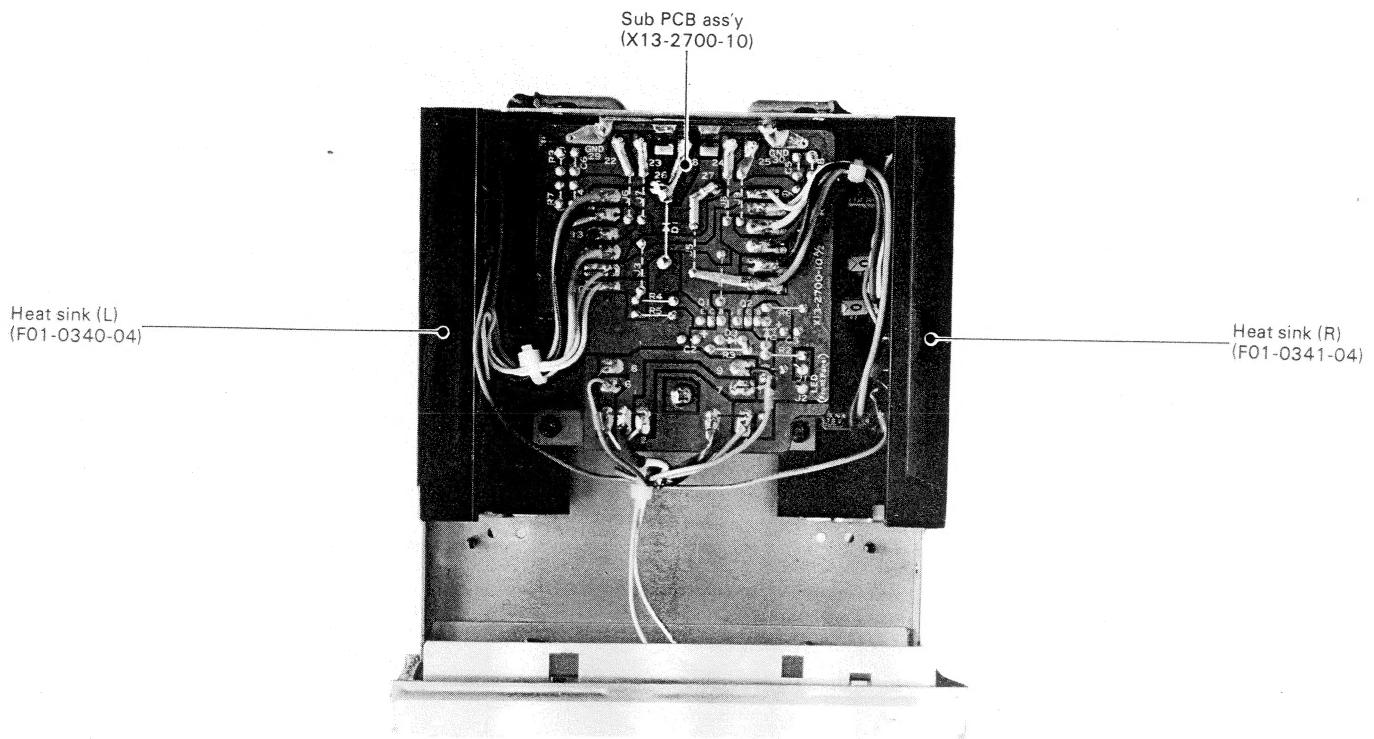


STEREO MAIN AMPLIFIER

EXTERNAL VIEW



INTERNAL VIEW/DISASSEMBLY FOR REPAIR

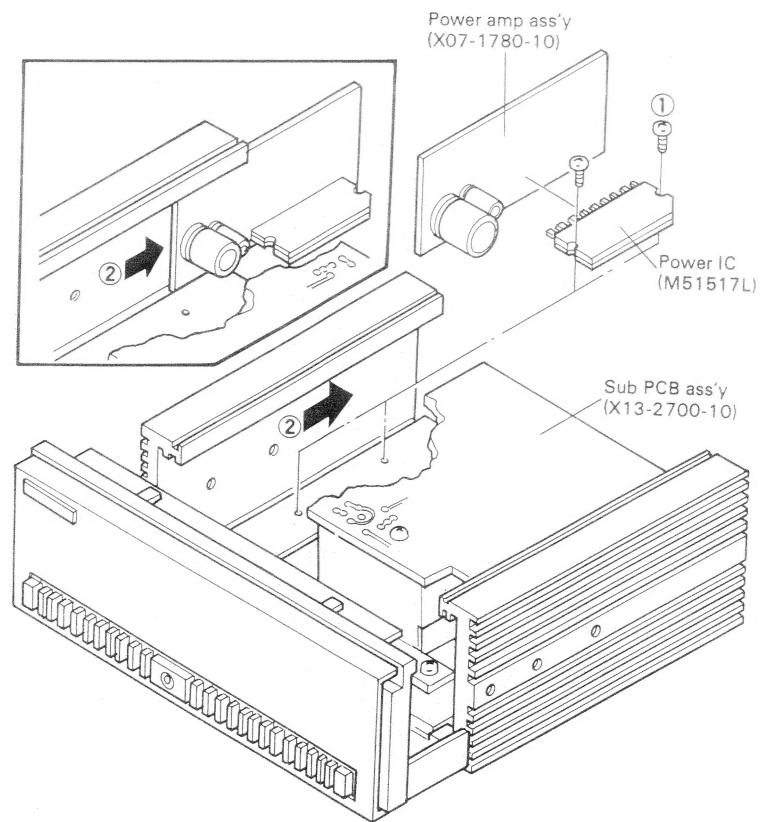


POWER IC DISASSEMBLY

- ① Remove the two screws from the heat sink.
- ② Slide the power PCB ass'y backwards.

CAUTION:

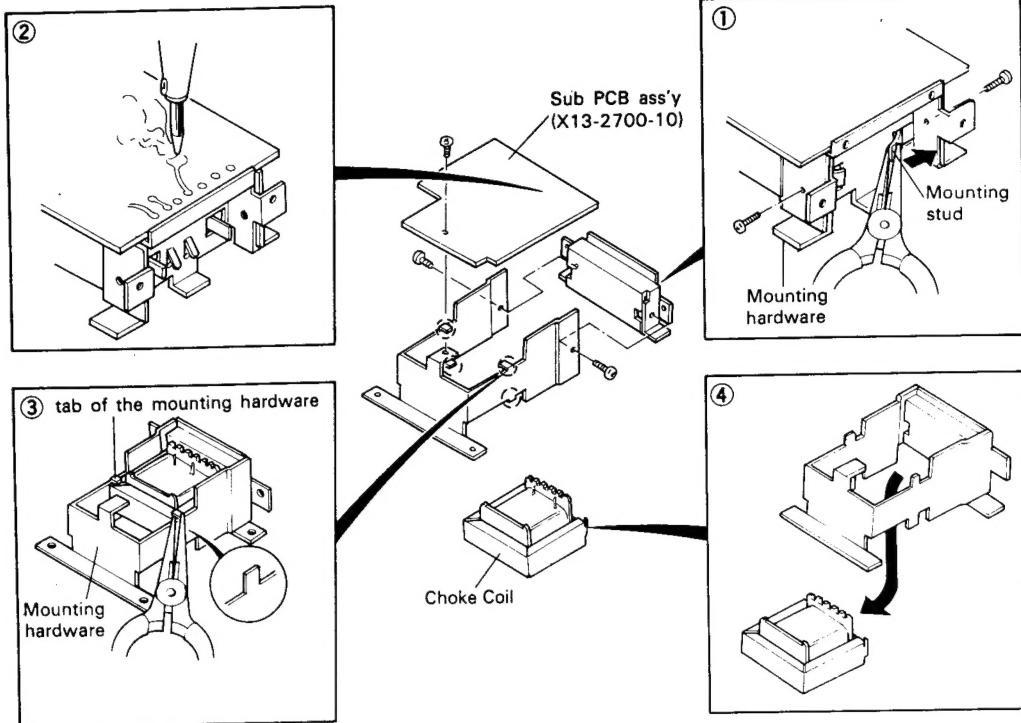
To avoid damaging the power IC by heat, apply the thermal compound to the back of the power IC.



DISASSEMBLY FOR REPAIR

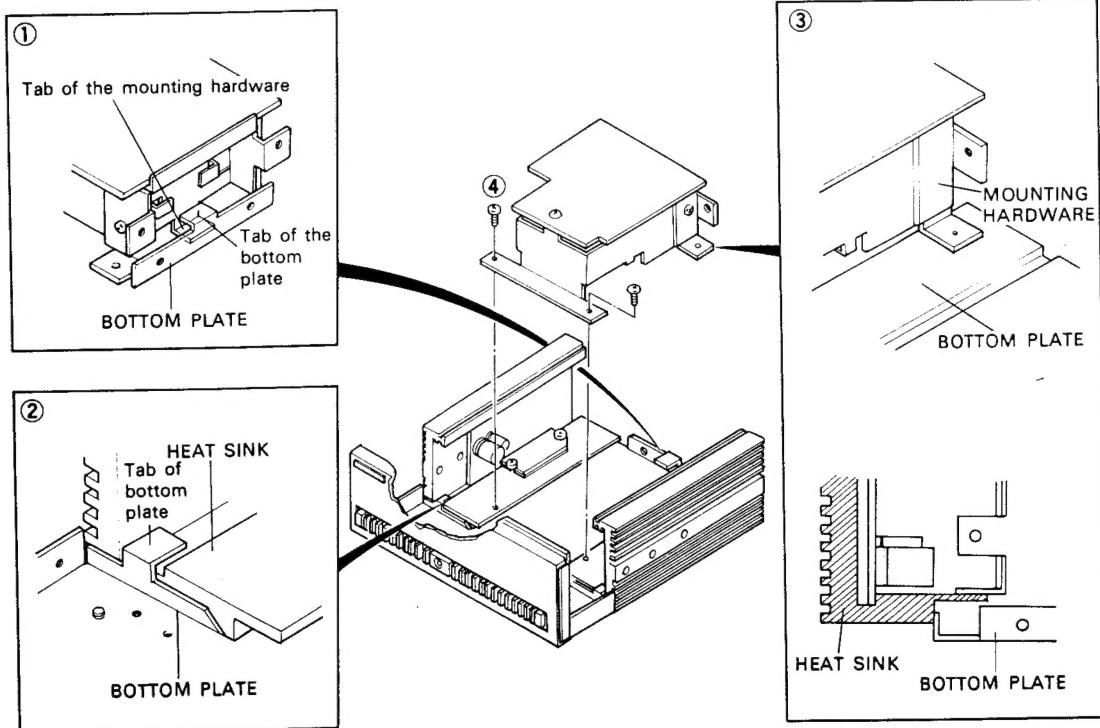
CHOKE COIL AND DIODE DISASSEMBLY

- ① Remove the two screws from the mounting hardware and spread the mounting stud of the choke coil.
- ② Unsolder the leads of the choke coil. Remove the screw from the Sub PCB ass'y and remove the PCB ass'y.



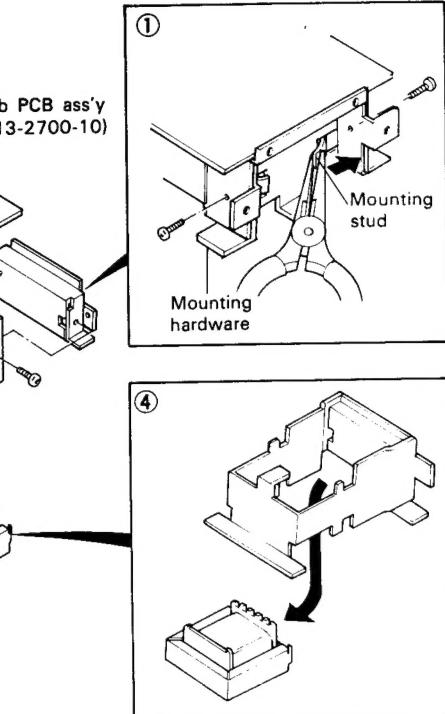
ASSEMBLY

- ① Position the tab of the bottom plate above that of the mounting hardware.
- ② Insert the tab of the bottom plate to the slit of the heat sink.



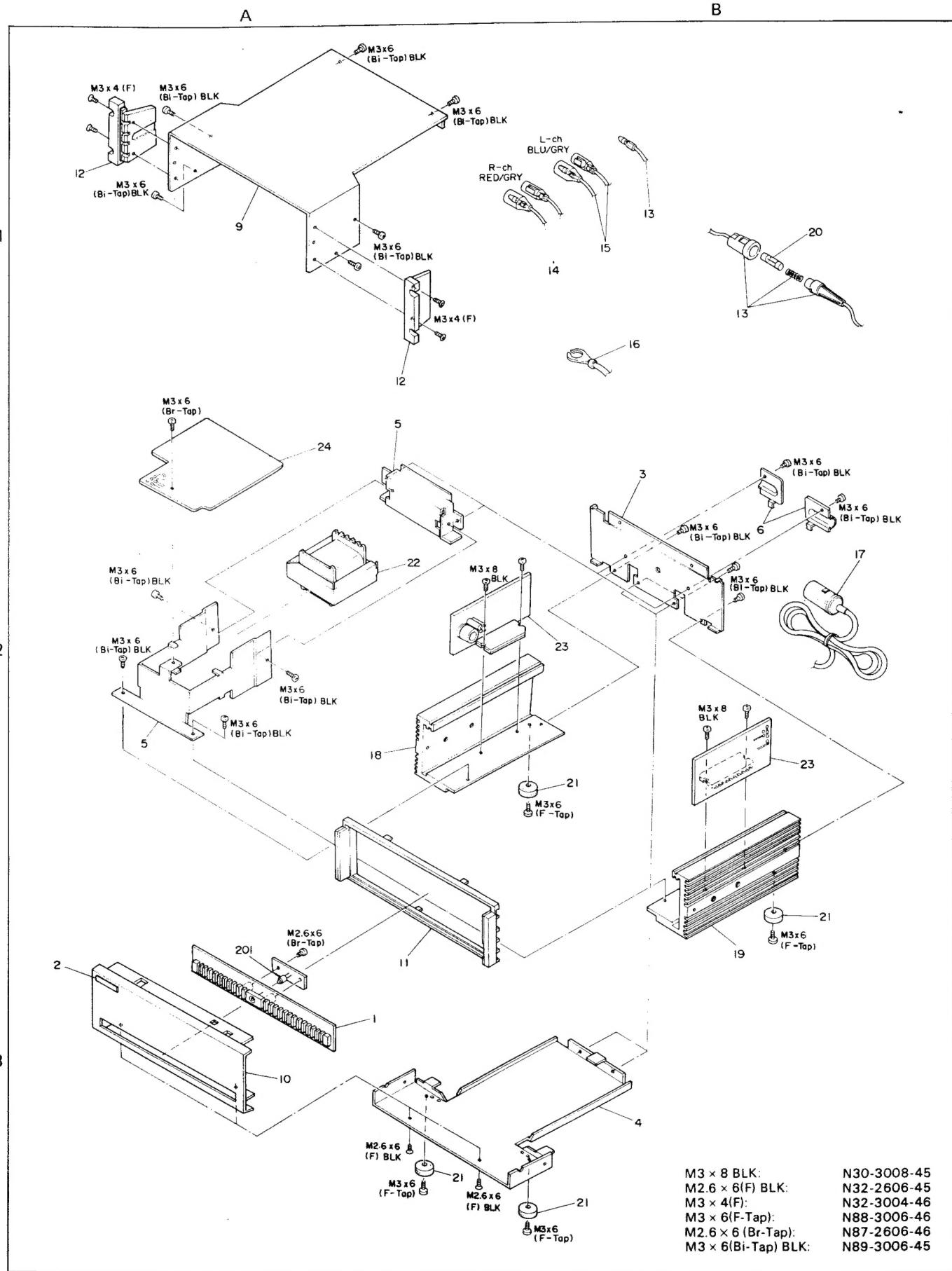
When replacing or removing the diode (D1), the following procedures are not necessary.

- ③ Set up the tab of the mounting hardware.
- ④ Remove the choke coil.



- ③ Put the heat sink between the mounting hardware and the bottom plate.
- ④ Fasten the mounting hardware with the screws.

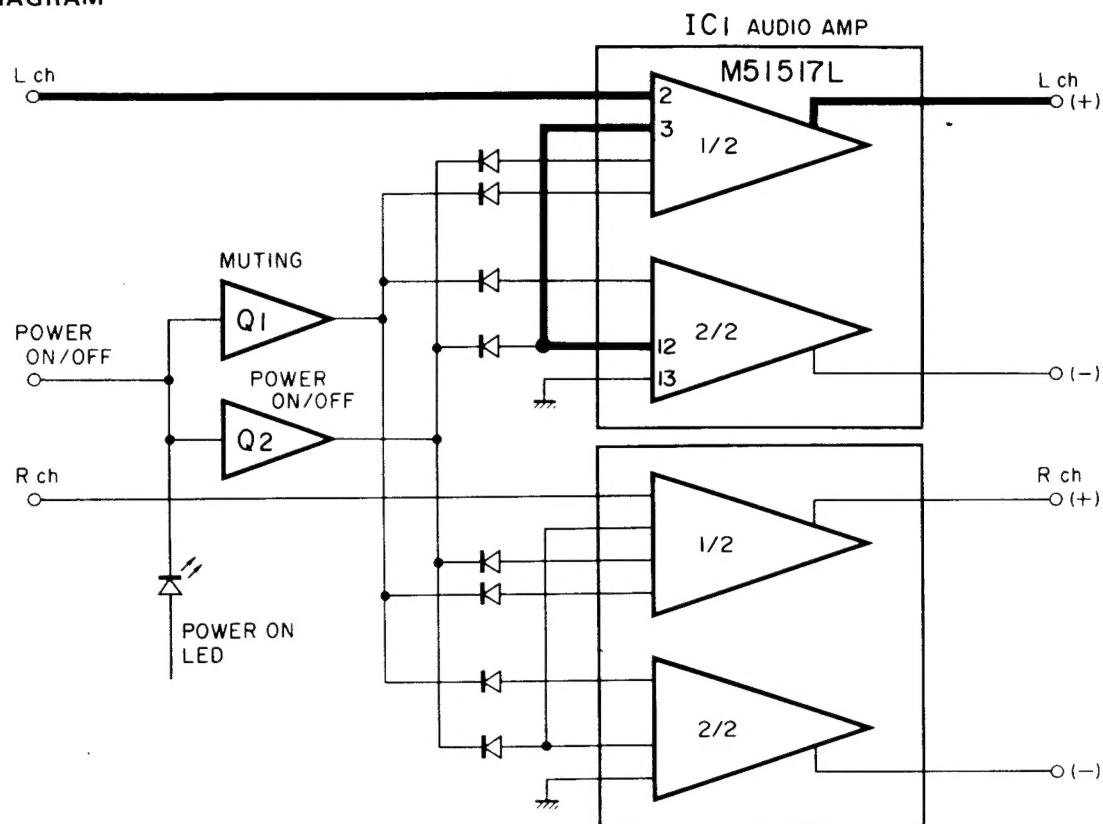
EXPLODED VIEW



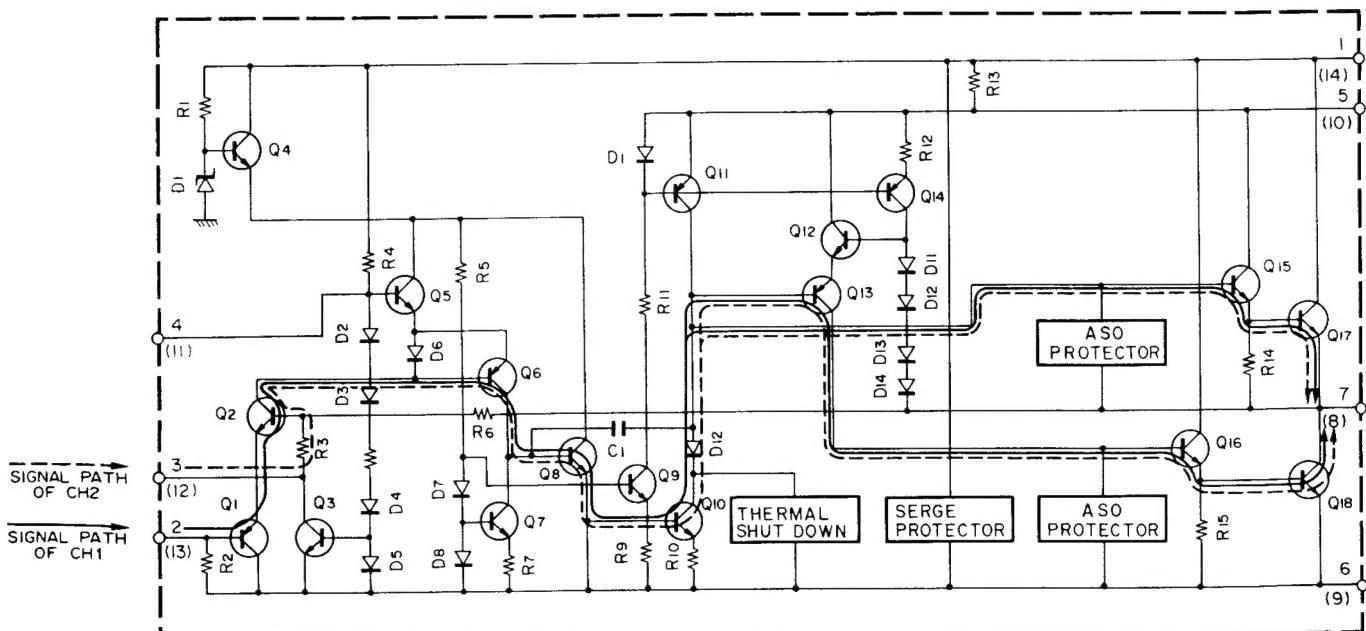
M3 x 8 BLK:	N30-3008-45
M2.6 x 6(F) BLK:	N32-2606-45
M3 x 4(F):	N32-3004-46
M3 x 6(F-Tap):	N88-3006-46
M2.6 x 6 (Br-Tap):	N87-2606-46
M3 x 6(Bi-Tap) BLK:	N89-3006-45

BLOCK DIAGRAM/CIRCUIT DESCRIPTION

BLOCK DIAGRAM



CIRCUIT DESCRIPTION



<SCHEMATIC OF M51517L INTERNAL>

CIRCUIT DESCRIPTION

This integrated circuit includes 2-channel amplifiers, as shown in the block diagram, and it can be used for stereo signal amplification as well as for monaural signal amplification in a BTL connection.

Principle of BTL

The principle of the BTL connection is explained in the following. When the \oplus output terminals of channel 1 and inverted channel 2 are connected to the speaker, as shown in the figure below, a voltage twice the single channel output voltage is applied to the speaker, as listed in the table on the right. This is as if the power supply voltage is doubled. However, it must be noted that the speaker's \ominus terminal is not at the ground voltage level, and that has a voltage (floated) cannot be grounded. Grounding of this kind of \ominus or any speaker terminal means a short-circuit at the amplifier's output, and may cause damage to the integrated circuit.

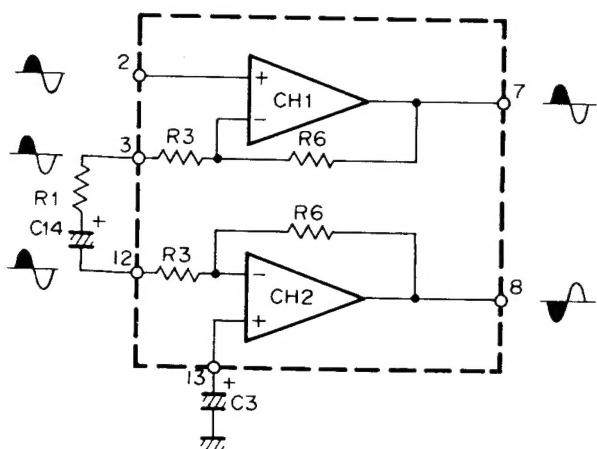
BTL connection for M51517L

The input signal for channel 1 is applied to input terminal 2, and the non-inverted output is obtained on terminal 3. For channel 2, when input terminal 13 is grounded and the input signal is applied to terminal 12, the inverted output is obtained on terminal 8. The BTL connection is made by connecting the terminal 3 to 12 and connecting a speaker between the terminals 7 and 8. The gain of channels 1 and 2 can be balanced when the resistor is inserted between the terminals 3 and 12.

POWER ON/OFF CIRCUIT

(1) In the case of power OFF, the base of Power ON/OFF transistor Q2 is pulled down by a $10k\Omega$ resistor R6, and Q2 turns ON. Then terminals 4 and 11 of the IC are pulled to a ground voltage level through diodes D1 and D2. Therefore, in the IC, Q5 connected to the terminal 4 is cut off, and the current is not supplied to Q6.

Q8 is also cut off, then Q10 is cut off. Q13 is cut off since its



<SIMPLIFIED SCHEMATIC OF BTL CONNECTION>

base voltage is $+B$. Q16 turned OFF with its base voltage at OV, then Q18 is turned OFF. Finally, the $+B$ voltage appears at terminal 7.

The base of the Muting transistor Q1 is OV to cut off, and the emitter is approximately OV. Then, terminals 3 and 12 of the integrated circuit are pulled to a ground voltage level through diodes D3 and D4. In the integrated circuit, the base voltage of Q2 is lowered to cut off both Q1 and Q2 and the muting function is operated.

(2) In the case of power ON, $+B$ is applied to the base of Q2, and it is cut off. Diodes D1 and D2 are reverse biased, so that the integrated circuit is biased normally to bring it into operation. Meanwhile, a voltage from the RC delay circuit (R3 and C2) is applied to the base of Q1, and it turns ON after approx. 1.5 sec determined by the time constant. The emitter voltage, then, goes up to a $+B$ voltage level. Diodes D3 and D4 are reversely biased, making the circuit open, and Muting is released. The discharging diode D3 in the muting circuit resets the circuit condition after the power is turned OFF, so that the muting time length of 1.5 sec is effective when the power is turned ON next.

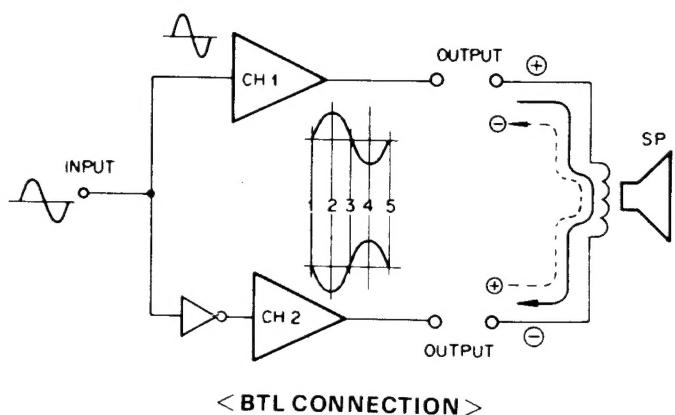
OTHERS

The protection diode D1 mounted on SUB PC BOARD is to make a short-circuit to blow the fuse when the supply voltage is connected oppositely.

The choking coil protects the circuit from the external pulse noise such as the ignition noise.

CAUTION:

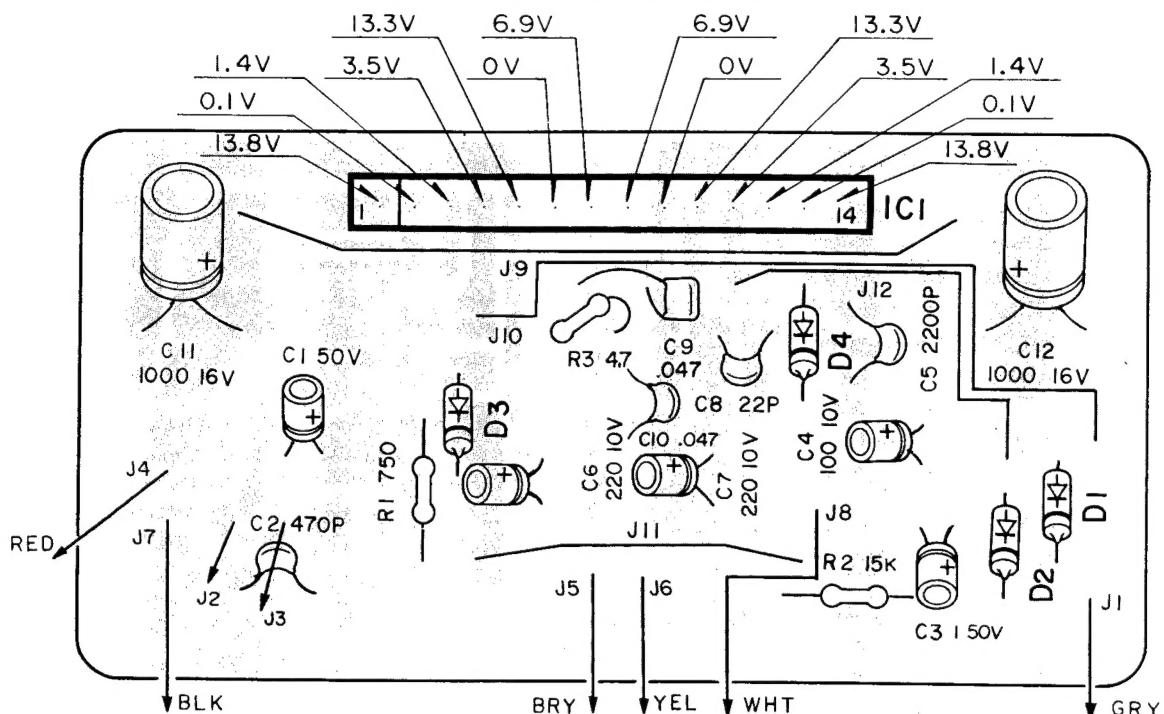
This amplifier uses the BTL connected circuit as mentioned before, so make sure of the following. Since the ground line of the amplifier is floated, when connecting the measuring instruments (oscilloscope, VTVM, distortion meter, load resistors etc.), make sure to use the floated GND terminals. When their grounds are connected to the ground terminals of the power supply, oscillator, etc., the output of the M51517L will be short-circuited and IC may be damaged.



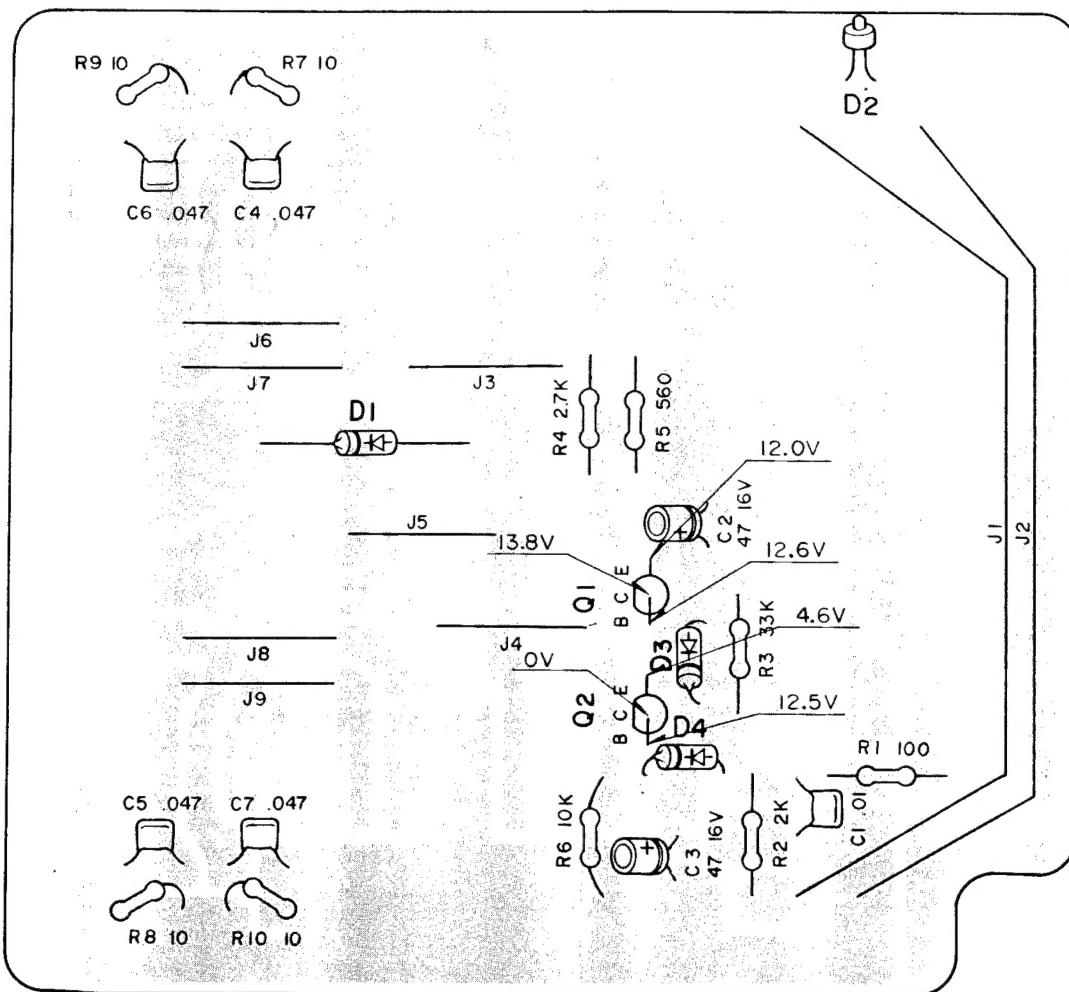
	1	2	3	4	5
CH1	0	+	0	-	0
CH2	0	-	0	+	0
Total	0	2 times	0	2 times	0

PC BOARD

POWER AMP (X07-1780-10) Components side view



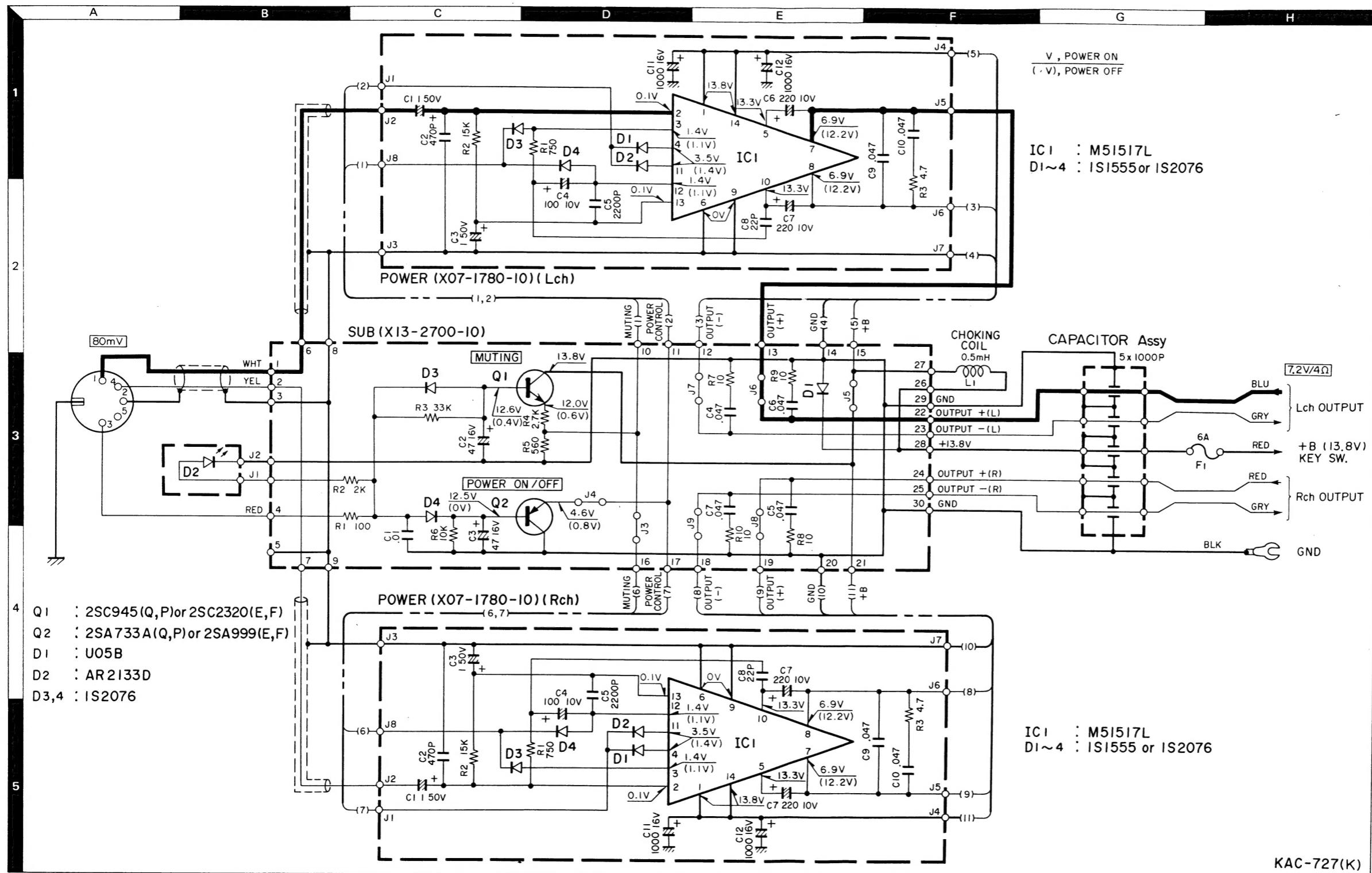
SUB (X13-2700-10) Components side view



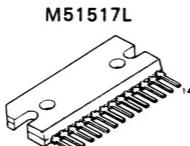


STEREO MAIN AMPLIFIER

KAC-727



2SA733
2SA999
2SC945
2SC2320



DC voltages are measured by a VOM with $20\text{k}\Omega/\text{V}$ input impedance.

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